

CLAIMS

What is claimed is:

1. A high capacity miter saw, comprising:
  - a miter base extending substantially in a horizontal plane;
  - a first supporting arm which rises in a substantially vertical direction from the miter base, a proximal end of the first supporting arm being attached to the miter base, a distal end of the first supporting arm having a first pivot point;
  - a second supporting arm coupled to the first supporting arm through the first pivot point, the second supporting arm capable of being pivoted about the first pivot point; and
  - a rotary cutting blade supported by a distal end of the second supporting arm, the rotary cutting blade having a rotary point about which the rotary cutting blade rotates, the rotary point being extendable to a minimum vertical height from the miter base that is lower than a vertical height from the miter base to the first pivot point.
2. The high capacity miter saw of Claim 1, wherein the first supporting arm is fixed in place.
3. The high capacity miter saw of Claim 1, wherein the first supporting arm bevels with respect to the miter base.
4. The high capacity miter saw of Claim 1, further comprising a gear box having a first direction of extension substantially perpendicular to a plane containing the rotary cutting blade and a second direction of extension substantially perpendicular to the first direct of extension, the gear box operatively coupled to the rotary cutting blade through the first rotary point.
5. The high capacity miter saw of Claim 4, wherein the second direction of

extension is a major direction of extension of the gear box.

6. The high capacity miter saw of Claim 5, wherein the second direction of extension is substantially vertical from the plane of the miter base.

7. The high capacity miter saw of Claim 4, wherein the gear box is significantly thinner, as measured by the first direction of extension, proximate to the rotary point of the rotary saw blade.

8. The high capacity miter saw of Claim 4, wherein the gear box is motorized.

9. The high capacity miter saw of Claim 4, wherein the gear box is substantially box shaped.

10. The high capacity miter saw of Claim 4, wherein the gearbox is thinned at one end.

11. The high capacity miter saw of Claim 1, further comprising a safety guard assembly including a safety guard rotatable about the rotary point of the rotary cutting blade and a lever mechanism for controlling the position of the safety guard in relation to the rotary point.

12. The high capacity miter saw of Claim 11, wherein the lever mechanism includes a first bar and a second bar pivotably attached to each other at a second pivot point.

13. The high capacity miter saw of Claim 12, wherein a first end of the lever mechanism is attached at the first pivot point and a second end of the lever mechanism is attached proximate to the rotary point of the rotary cutting blade.

14. The high capacity miter saw of Claim 1, further comprising a handle for positioning the rotary saw blade, the handle being secured to the second supporting arm.

15. The high capacity miter saw of Claim 4, further comprising a handle for positioning the rotary saw blade, the handle being secured to the gearbox.

16. The high capacity miter saw of Claim 1, wherein at least approximately half the back portion of the rotary saw blade is exposed to enable penetration into an item to be cut at the maximum cutting capacity.

17. A high capacity miter saw, comprising:

a miter base extending substantially in a horizontal plane;

a first supporting arm coupled to the miter base that rises in a substantially vertical direction from the miter base, a distal end of the first supporting arm having a first pivot point;

a second supporting arm coupled to the first supporting arm through the first pivot point;

a rotary cutting blade supported proximate to a distal end of the second supporting arm, the rotary cutting blade having a rotary point about which the rotary cutting blade rotates, the rotary point being extendable to a minimum vertical height from the miter base that is lower than a vertical height from the miter base to the first pivot point; and

a substantially cylindrical motorized gear box having a first direction of extension substantially perpendicular to a plane containing the rotary cutting blade and a second direction of extension substantially perpendicular to the first direction of extension, the substantially cylindrical motorized gear box having an end which is attached to the rotary point of the rotary cutting blade.

18. The high capacity miter saw of Claim 17, wherein the first supporting arm is stationary.

19. The high capacity miter saw of Claim 17, wherein the first supporting arm bevels with respect to the miter base.

20. The high capacity miter saw of Claim 17, wherein a thinned end of the substantially cylindrical motorized gearbox is attached to the rotary point of the rotary cutting blade.

21. The high capacity miter saw of Claim 20, wherein the second direction of extension is a major direction of extension of the gear box.
22. The high capacity miter saw of Claim 21, wherein the second direction of extension is substantially vertical from the plane of the miter base.
23. The high capacity miter saw of Claim 20, wherein the substantially cylindrical gear box is significantly thinner, as measured by the first direction of extension, proximate to the rotary point of the rotary saw blade.
24. The high capacity miter saw of Claim 20, wherein a cross section of the substantially cylindrical gear box is substantially rectangular.
25. The high capacity miter saw of Claim 17, further comprising a safety guard assembly including a safety guard rotatable about the rotary point of the rotary cutting blade and a lever mechanism for controlling the position of the safety guard in relation to the rotary point.
26. The high capacity miter saw of Claim 25, wherein the lever mechanism includes a first bar and a second bar pivotably attached to each other at a second pivot point.
27. The high capacity miter saw of Claim 26, wherein a first end of the lever mechanism is attached at the first pivot point and a second end of the lever mechanism is attached proximate to the rotary point of the rotary cutting blade.

28. The high capacity miter saw of Claim 17, further comprising a handle for positioning the rotary saw blade, the handle being secured to one of the group consisting of the second supporting arm and the motorized gearbox.

29. The high capacity miter saw of Claim 20, further comprising a handle for positioning the rotary saw blade, the handle being secured to the gearbox.

30. A high capacity miter saw, comprising:

a miter base extending substantially in a horizontal direction;

a first supporting arm which rises in a substantially vertical direction from the miter base, a proximal end of the first supporting arm being attached to the miter base, a distal end of the first supporting arm having a first pivot point;

a second supporting arm coupled to the first supporting arm through the first pivot point, the second supporting arm capable of being pivoted about the first pivot point;

a rotary cutting blade supported by a distal end of the second supporting arm, the rotary cutting blade having a rotary point about which the rotary cutting blade rotates, the rotary point being offset from the second supporting arm such that the rotary point is closer to the miter base than any portion of the second supporting arm during a cutting operation.

31. The high capacity miter saw of Claim 30, wherein the first supporting arm is fixed in place.

32. The high capacity miter saw of Claim 30, wherein the first supporting arm bevels with respect to the miter base.

33. The high capacity miter saw of Claim 30, further comprising a safety guard covering no more than a 150 degree arc of the rotary cutting blade.

34. The high capacity miter saw of Claim 30, further comprising a gear box having a first direction of extension substantially perpendicular to a plane containing the rotary cutting blade, the gear box operatively coupled to the rotary cutting blade through the first rotary point, the gearbox being thinned near the rotary point as measured by the

first direction of extension, the gearbox having a major longitudinal axis oriented away from an item to be cut when in the miter saw is in operation.

35. A high capacity miter saw, comprising:

- a miter base extending substantially in a first horizontal plane;

- a first supporting arm which rises in a substantially vertical direction from the miter base, a proximal end of the first supporting arm being attached to the miter base, a distal end of the first supporting arm having a first pivot point;

- a second supporting arm coupled to the first supporting arm through the first pivot point, the second supporting arm capable of being pivoted about the first pivot point; and

- a rotary cutting blade supported at an other end of the second supporting arm, the rotary cutting blade having a rotary point about which the rotary cutting blade rotates,

- wherein, for a second horizontal plane that includes the pivot point, an imaginary line formed from the pivot point to the rotary point forms an angular relationship with the second horizontal plane such that when the rotary cutting blade is extended to a maximum cutting capacity, the angle between the imaginary line from the pivot point to the rotary point and the second horizontal plane is less than positive 10 degrees.

36. The high capacity miter saw of Claim 35, wherein the angle between the imaginary line from the pivot point to the rotary point and the horizontal plane is less than 0 degrees.

37. The high capacity miter saw of Claim 35, wherein the angle between the imaginary line from the pivot point to the rotary point and the horizontal plane is less



PTG 02-59-2

than negative 10 degrees.